

REMARKS

Please reconsider the present application in view of the above amendments and following remarks. Applicants thank the Examiner for carefully considering the present application.

Claims 1-23 and 28-67 are currently pending. By way of this reply, claims 24-27 have been reinstated, claims 1, 4-10, 34-36, 38, 40-45, 52, 55-60, and 68 have been amended, and claims 3, 20, 39, and 54 have been canceled.

Reinstating Claims 24-27

In the 2nd paragraph of the Office Action, the Examiner withdraws a previously issued restriction requirement. Applicants previously withdrew claims 24-27 responding to the restriction requirement. Applicants appreciate the Examiner's withdrawal and hereby reinstate claims 24-27 and label their status as ORIGINAL.

Response to Rejection Under 35 USC § 102(e) in View of Regnier

In the 4th paragraph of the Office Action, the Examiner rejects independent claim 20 under 35 USC § 102(e) as allegedly being anticipated by "ETA: Experience with an Intel/spl reg/Xeon/spl trade/processor as a Packet Processing Engine, Proceedings of the 11th Symposium on High Performance Interconnects" by Regnier, et al. in IEEE, Aug. 20-222003: 76-82 ("Regnier"). Independent claim 20 is hereby cancelled. Thus, the rejection of claim 20 is moot.

Response to Rejection Under 35 USC § 102(b) in View of Rohlman

In the 5th paragraph of the Office Action, the Examiner rejects claims 21-26, 28, 30, 32, 34, 38, 52, and 66-68 under 35 USC § 102(b) as allegedly being anticipated by U.S. Patent Application Publication No. 2001/0032307 to Rohlman, et al. (“Rohlman”). For the reasons set forth below, these rejections are respectfully traversed.

Independent claim 21 as filed recites a network processor that includes an upper pipeline that receives a signal indicative of an instruction queue depth corresponding to a plurality of threads and uses the signal to determine an instruction fetch sequence. The network processor also includes a lower pipeline that receives a thread conditions signal indicative of an execution stall corresponding to the plurality of threads and uses the signal to determine a thread execution sequence. Likewise, independent claims 66 and 67 recite similar claimed features.

Rohlman, among other differences, does not disclose “an upper pipeline, having an input coupled to receive a signal indicative of an instruction queue depth corresponding to a plurality of threads, the upper pipeline determining an instruction fetch sequence for the plurality of threads based on the instruction queue depth signal; and a lower pipeline, comprising a first input to receive decoded instructions and a second input to receive a thread conditions signal, the lower pipeline determining a thread execution sequence based on the thread conditions signal, the thread conditions signal indicative of an execution stall corresponding to the plurality of threads.” Rohlman, in contrast, discloses an instruction pipeline in a microprocessor, comprising a plurality of pipeline units with each of the pipeline units processing instructions. See Rohlman, Abstract. Rohlman merely teaches about the instruction pipeline and its pipeline units, and is totally silent as to the claimed features of independent claim 21 as cited above.

In view of the above, Rohlman fails to disclose each and every limitation recited in independent claims 21, 66, and 67. Thus, independent claims 21, 66, and 67 are patentably distinguishable over the cited reference. Dependent claims 22-26, 28, 30, and 32 are allowable

for at least the same reason. Accordingly, withdrawal of the § 102 rejections is respectfully requested.

Independent claim 34 as amended recites a method of thread interleaving that includes selecting a thread associated with a high priority instruction and a thread associated with a low priority instruction from a plurality of threads, and selecting between the two threads to output a corresponding decoded instruction. Likewise, independent claims 52 and 68 as amended recite similar claimed features.

Rohlman, among other differences, does not disclose “selecting a thread associated with a high priority instruction from the plurality of threads, selecting a thread associated with a low priority instruction from the plurality of threads, and selecting the thread between the thread associated with the high priority instruction and the thread associated with the low priority instruction.” Rohlman is totally silent as to priority associated with threads, and select threads based on associated priorities. Therefore, Rohlman fails to disclose each and every limitation recited in independent claims 34, 52, and 68 as amended. Thus, independent claims 34, 52, and 68 are patentably distinguishable over the cited reference. Dependent claim 38 is allowable for at least the same reason. Accordingly, withdrawal of the § 102 rejections is respectfully requested.

Response to Rejection Under 35 USC § 103(a) in View of Rohlman

In the 18th paragraph of the Office Action, the Examiner rejects claims 1, 2, 11-18, 26-27, 29, 31, 33, 35-37, 46-51, 53, and 61-65 under 35 USC § 103(a) as allegedly being unpatentable over Rohlman. For the reasons set forth below, these rejections are respectfully traversed.

Independent claim 1 has been amended to incorporate all limitations from dependent claim 3. In the 50th paragraph of the Office Action, the Examiner indicates that claim

3 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 3 depends directly from claim 1. Therefore, independent claim 1 as amended is allowable. Dependent claims 2, 11-15, 17, and 18 are allowable for at least the same reason.

As discussed above under the caption Response to Rejection Under 35 USC § 102(b) in View of Rohlman, independent claims 21, 34, and 52 are patentable over Rohlman. Dependent claims 26, 27, 29, 31, and 33 depend upon independent claim 21, dependent claims 35-37 and 46-51 depend upon independent claim 34, dependent claims 53 and 61-65 depend upon independent claim 52. Therefore, the dependent claims are patentable over Rohlman for at least the same reason. Accordingly, withdrawal of the § 103 rejections is respectfully requested.

Response to Rejection Under 35 USC § 102(b) in View of Nemirovsky

In the 32nd paragraph of the Office Action, the Examiner rejects claims 34-43, 45, 52-58, 60, and 68 under 35 USC § 102(b) as allegedly being anticipated by U.S. Patent Application Publication No. 2002/0062435 to Nemirovsky, et al. (“Nemirovsky”). For the reasons set forth below, these rejections are respectfully traversed.

Independent claim 34 as amended recites a method of thread interleaving that includes selecting a thread associated with a high priority instruction and a thread associated with a low priority instruction from a plurality of threads, and selecting between the two threads to output a corresponding decoded instruction. Likewise, independent claims 52 and 68 as amended recite similar claimed features.

Nemirovsky, among other differences, does not disclose “selecting a thread associated with a high priority instruction from the plurality of threads, selecting a thread associated with a low priority instruction from the plurality of threads, and selecting the thread between the thread associated with the high priority instruction and the thread associated with the

low priority instruction.” Nemirovsky, in contrast, discloses a multi-streaming processor with multiple streams for processing multiple threads. See Nemirovsky, Abstract. In Nemirovsky, the thread with the highest priority is granted the functional resources. See Nemirovsky, paragraphs [0045] and [0046]. The Examiner points to paragraphs [0036] and [0037], and the first sentence of paragraph [0042] for teaching of the above claimed features. However, the cited sections merely disclose a multi-streaming processor that allocates resources to streams associated with the highest priority. Nemirovsky is totally silent as to selecting a thread associated with a low priority instruction from a plurality of threads, and selecting a thread between a thread associated with a high priority instruction and the thread associated with the low priority instruction.

In view of the above, Nemirovsky fails to disclose each and every limitation recited in independent claims 34, 52, and 68. Thus, independent claims 34, 52, and 68 are patentably distinguishable over the cited reference. Dependent claims are allowable for at least the same reason. Accordingly, withdrawal of the § 102 rejections is respectfully requested.

Response to Rejection Under 35 USC § 103(a) in View of Nemirovsky

In the 46th paragraph of the Office Action, the Examiner rejects claims 35-51 and 53-65 under 35 USC § 103(a) as allegedly being unpatentable over Nemirovsky. For the reasons set forth below, these rejections are respectfully traversed.

As discussed above under the caption Response to Rejection Under 35 USC § 102(b) in View of Nemirovsky, Independent claims 34 and 52 are patentable over Nemirovsky. Dependent claims 35-51 depend upon independent claim 34, dependent claims 53-65 depend upon independent claim 52. Therefore, the dependent claims are patentable for at least the same reason. Accordingly, withdrawal of the § 103 rejections is respectfully requested.

Response to Objection to Claims

In the 50th paragraph of the Office Action, the Examiner objects to claims 3-10 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Independent claim 1 has been amended to include all limitations from claim 3. Therefore, dependent claims 3-10 are allowable and the objection is overcome.

Conclusion

In sum, Applicants respectfully submit that claims 1, 2, 4-19, 21-38, 40-53, and 55-68, as presented herein, are patentably distinguishable over the cited references. Therefore, Applicants request reconsideration of the basis for the rejections to these claims and request allowance of them.

Should the Examiner wish to discuss the above amendments or if the Examiner believes that for any reason direct contact with Applicants' representative would help to advance the prosecution of this case to finality, the Examiner is invited to telephone the undersigned at the number given below.

Respectfully submitted,
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